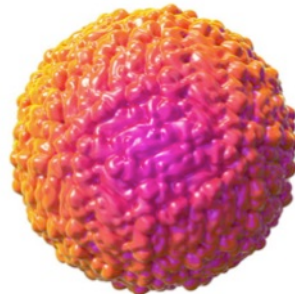
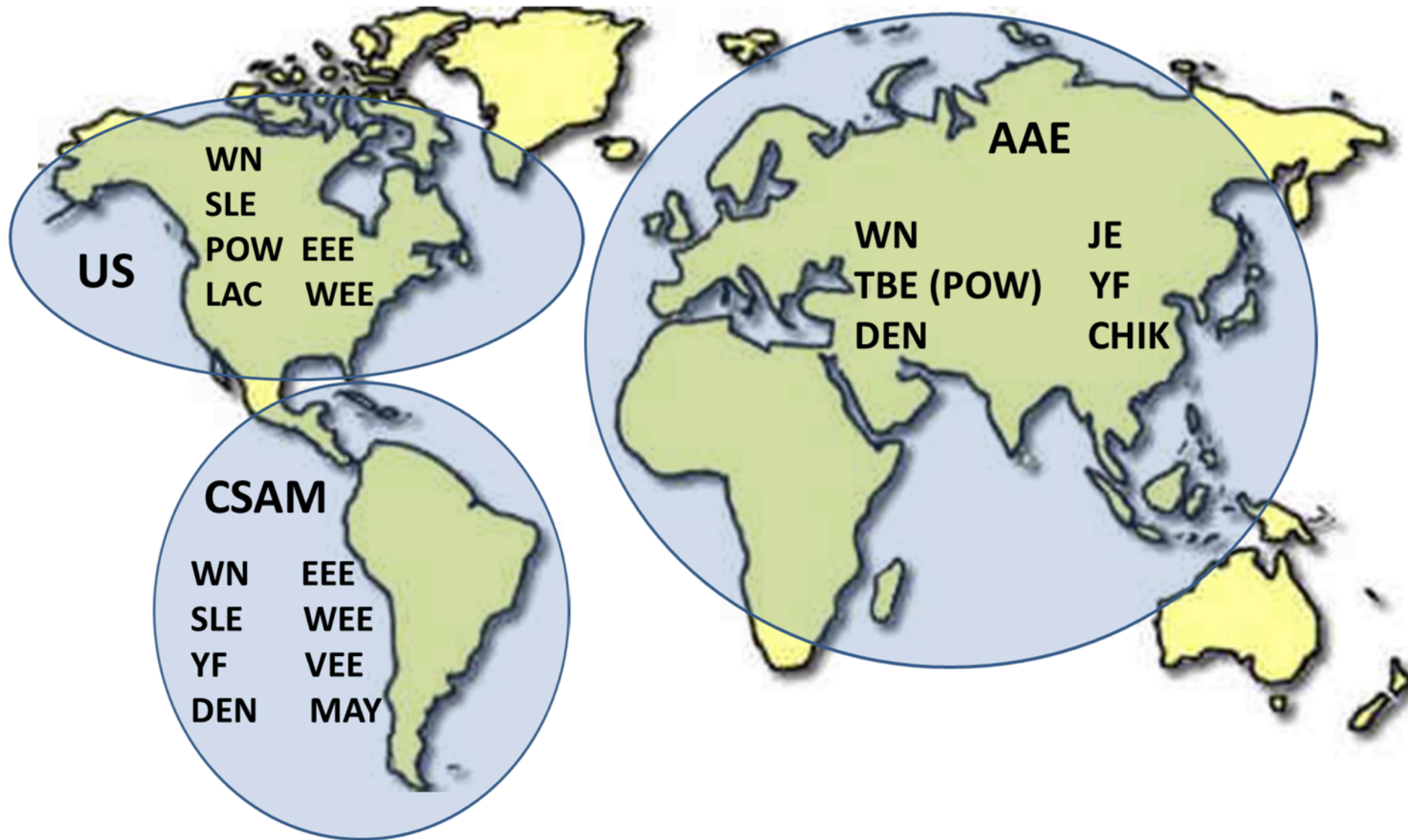


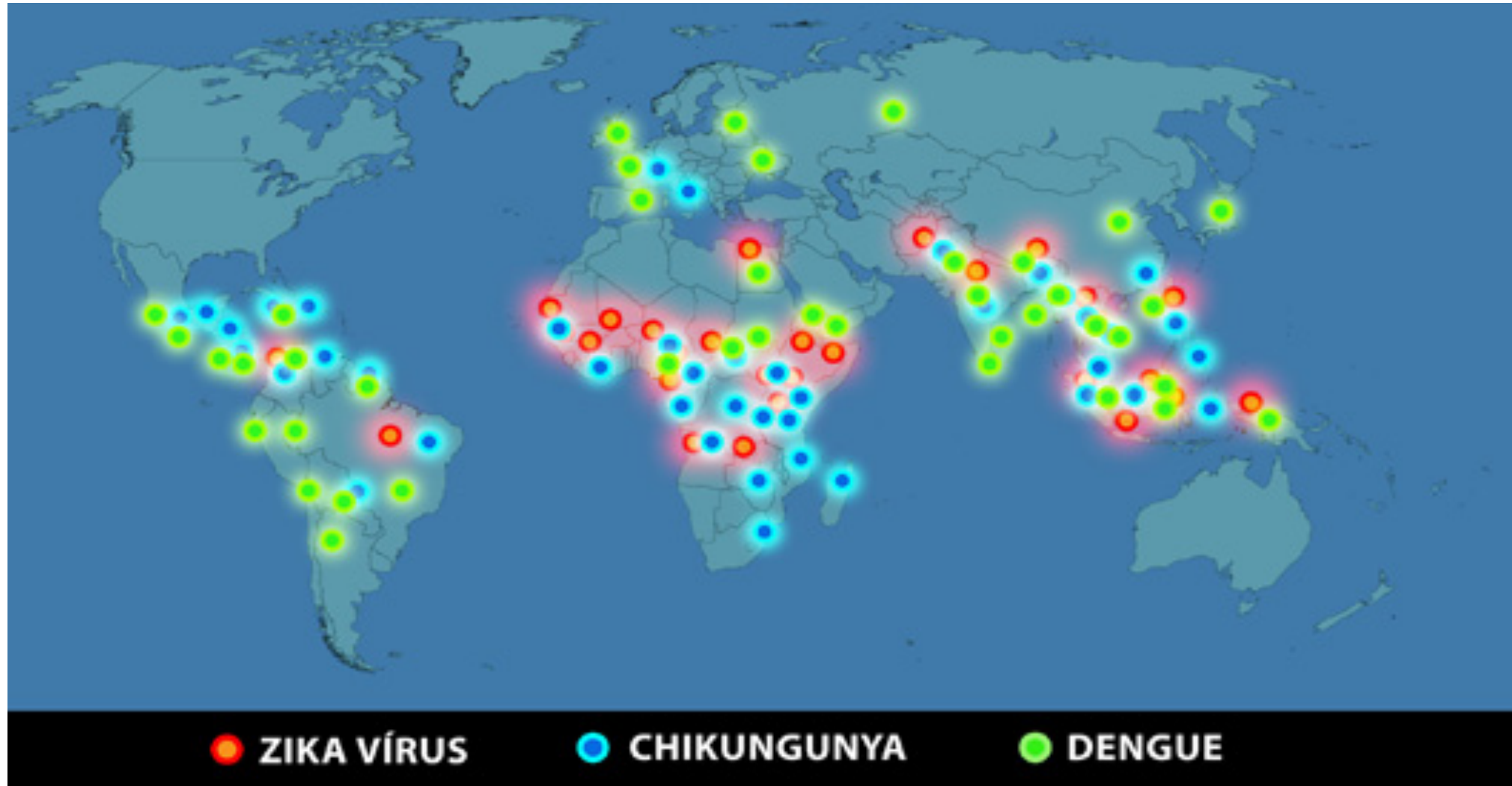
Learning from epidemics outside hospitals

ARBOVIRUS

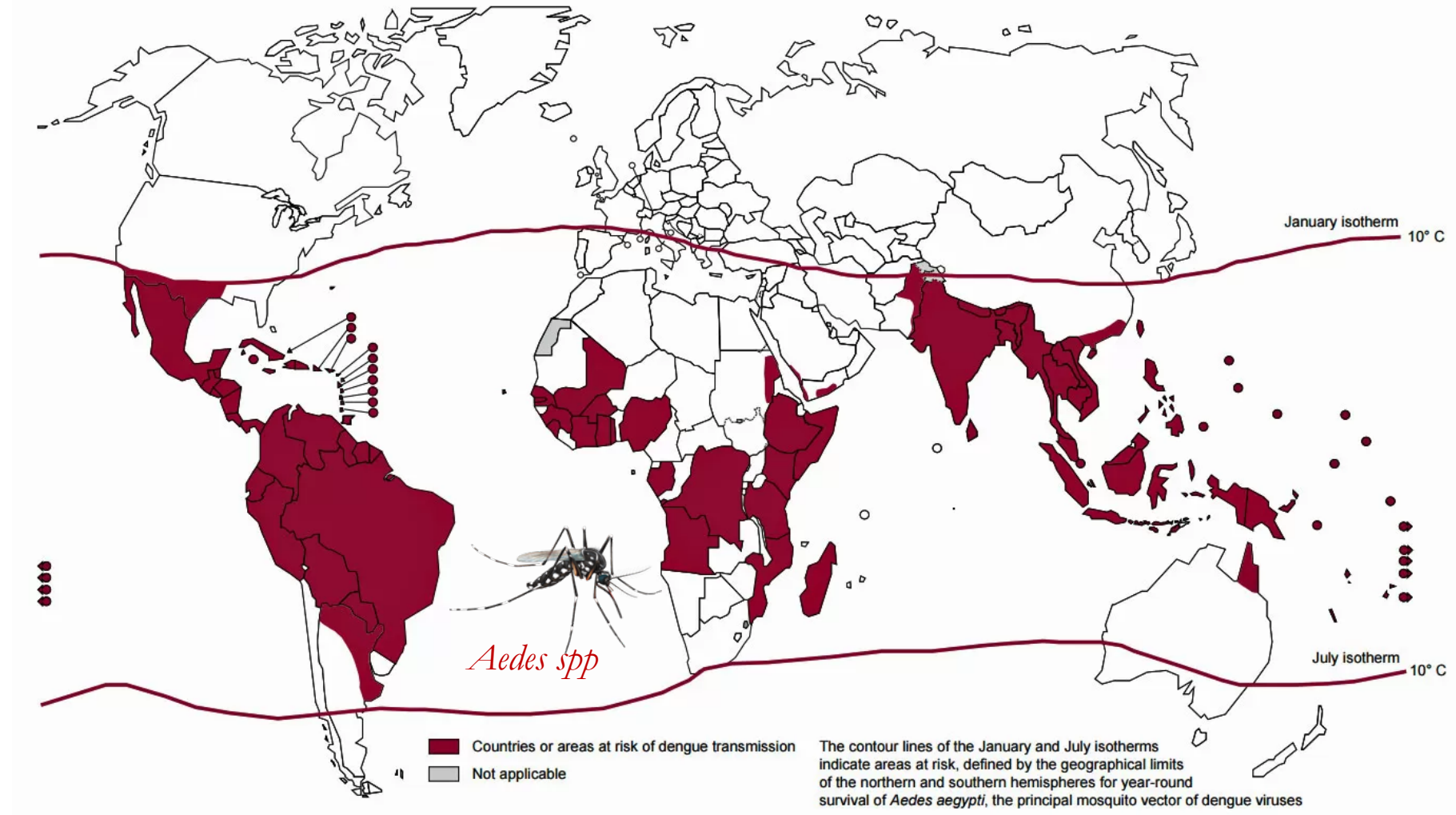
Carlos Magno Castelo Branco Fortaleza, MD, PhD
Associate Professor – Botucatu School of Medicine
State University of São Paulo (UNESP)







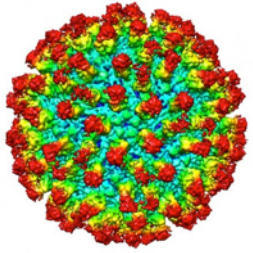
Which arboviruses?



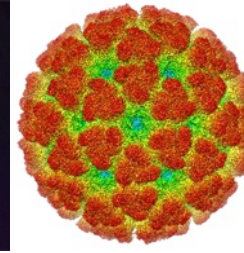
Which arboviruses?



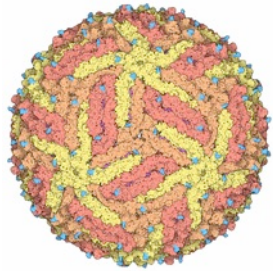
Which arboviruses?



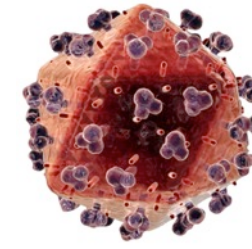
Dengue



Chikungunya

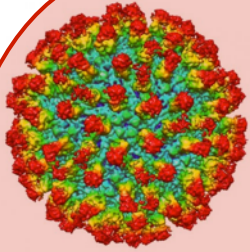


Zika



Yellow fever

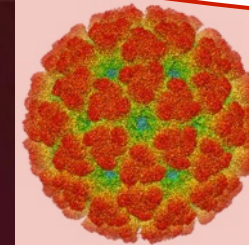
Which arboviruses?



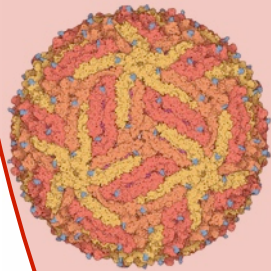
Dengue



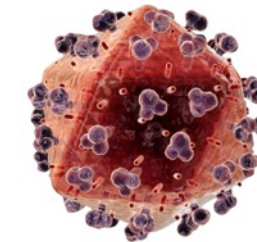
URBAN



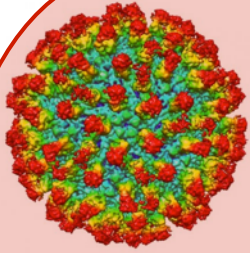
Chikungunya



Zika



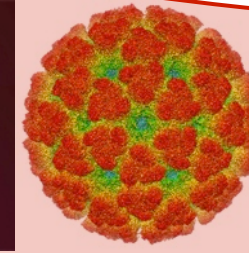
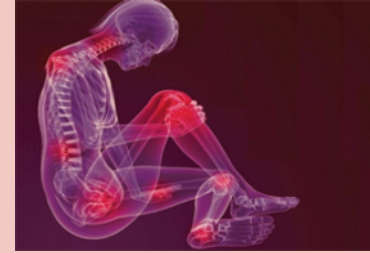
Yellow fever



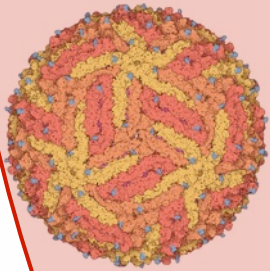
Dengue



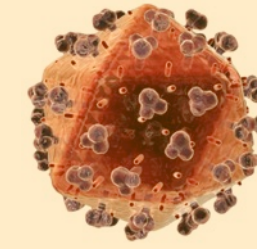
URBAN



Chikungunya



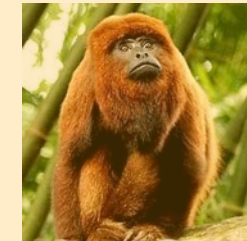
Zika



Yellow fever



SYLVATIC



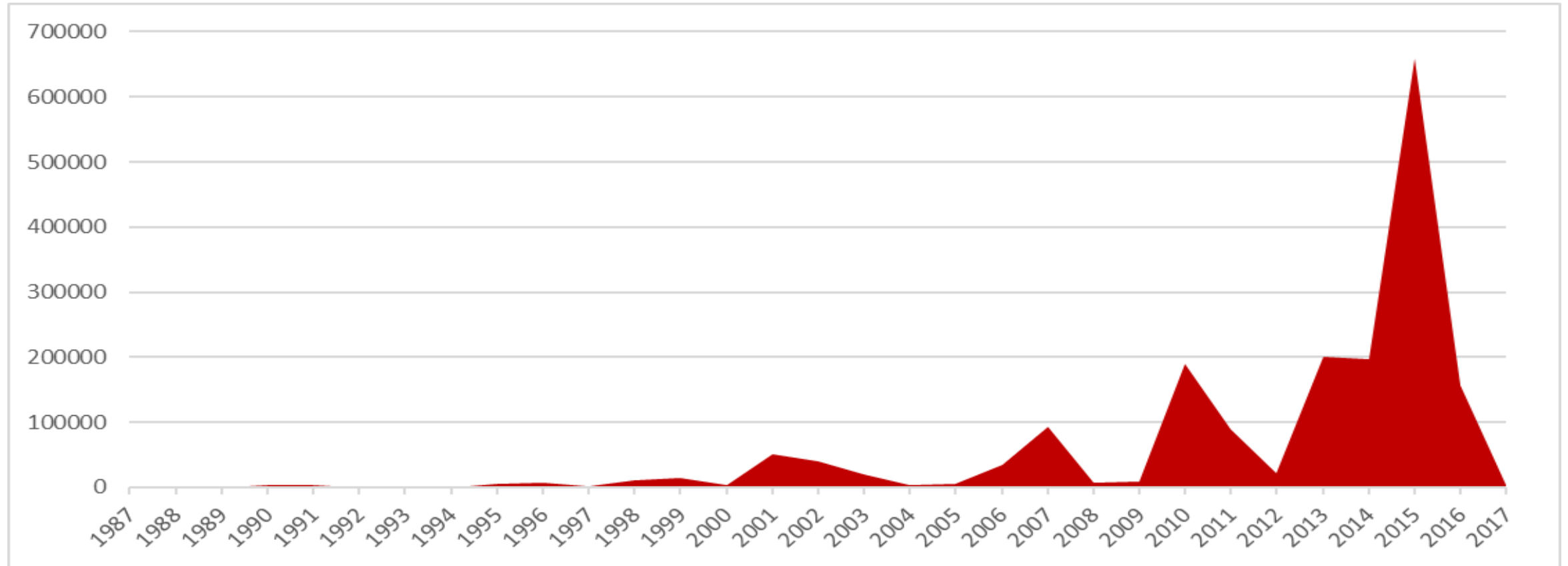


Hospitals may lie in-between



Hospitals in response and information

Dengue Fever - São Paulo State, Brazil

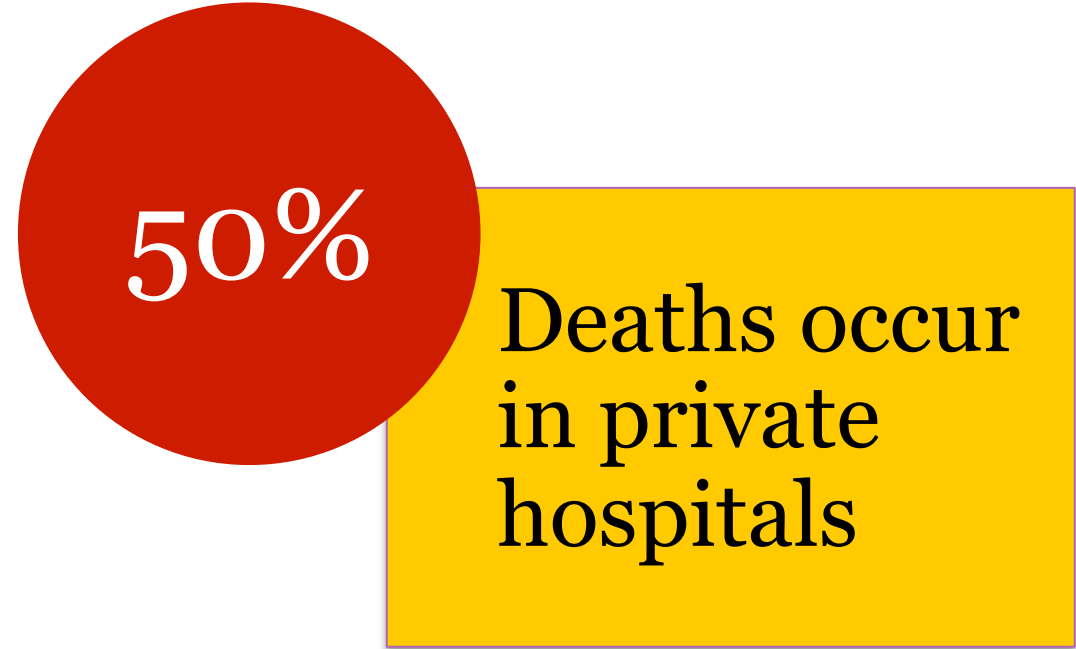


Hospitals

Prevent mortality

Health Surveillance

Severe Dengue: healthcare paradox

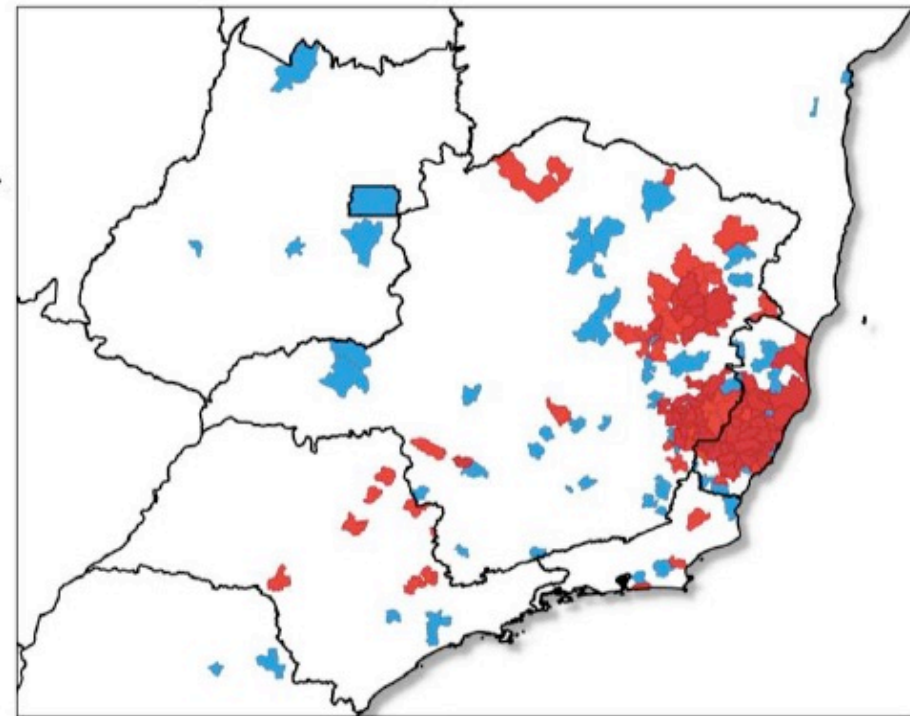


Urgent necessity of training doctors (especially in private practice) to identify warning signs for severity and prevent deaths.

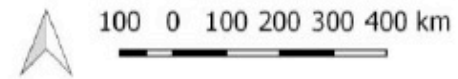
Yellow Fever, Brazil: 2016-2017



777 cases



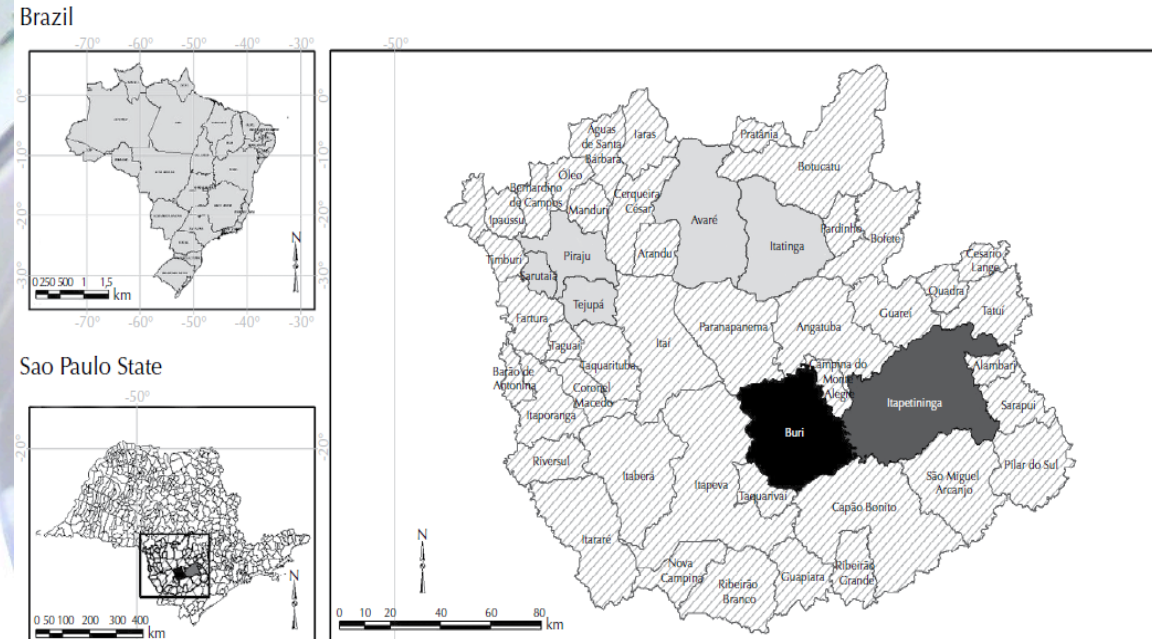
■ Casos confirmados
■ Casos em investigação



261 deaths

Yellow fever: reemerging in the state of Sao Paulo, Brazil, 2009

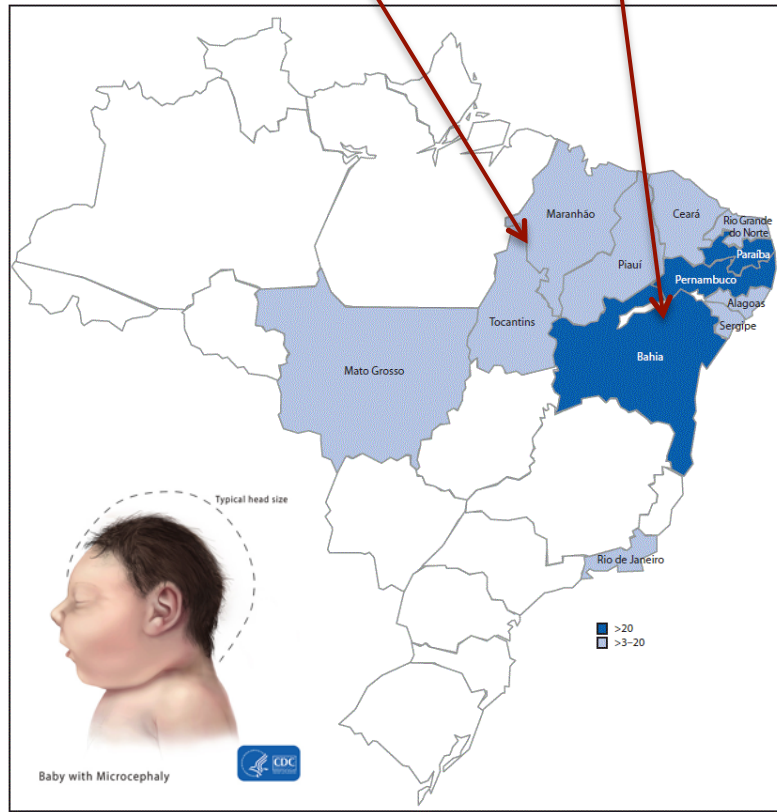
Melissa Mascheretti^I
 Ciléa H Tengan^I
 Helena Keiko Sato^I
 Akemi Suzuki^{II}
 Renato Pereira de Souza^{II}
 Marina Maeda^{II}
 Roosecelis Brasil^{III}
 Mariza Pereira^{III}
 Rosa Maria Tubaki^{III}
 Dalva M V Wanderley^{III}
 Carlos Magno Castelo Branco Fortaleza^{IV}
 Ana Freitas Ribeiro^I
 Yellow Fever Group*



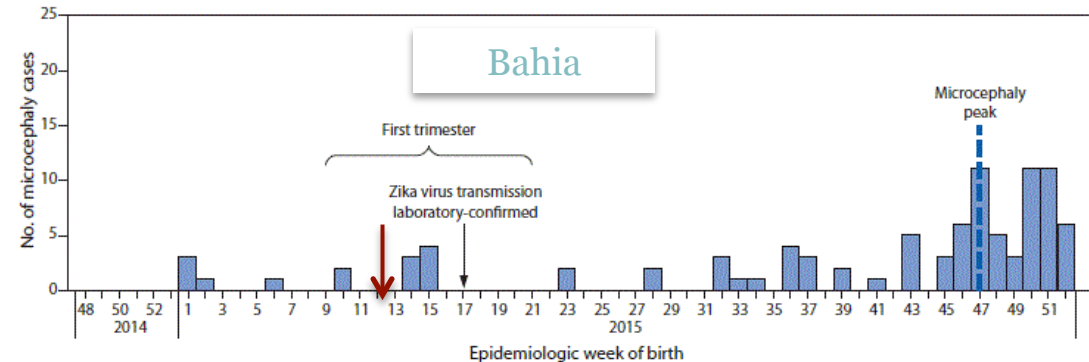
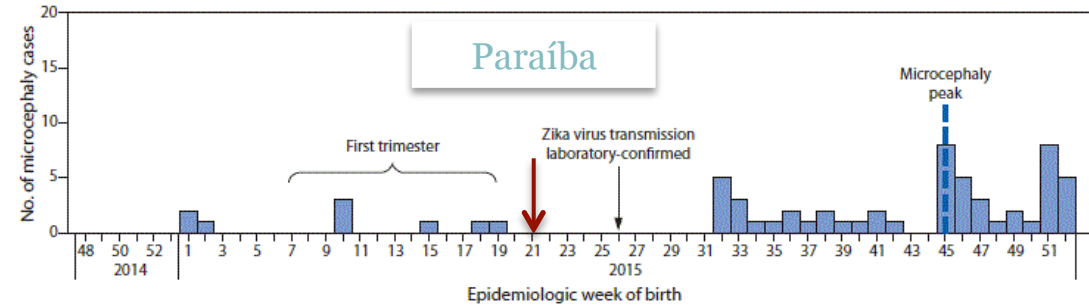
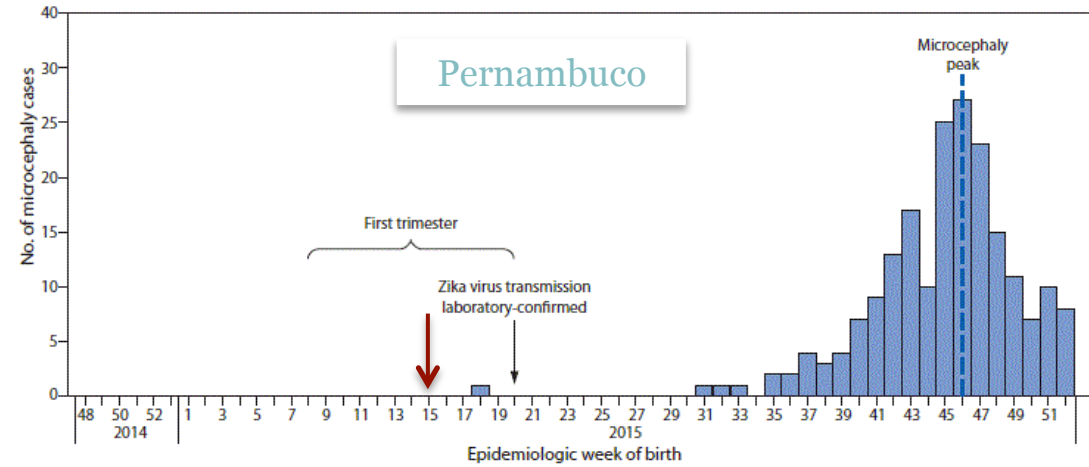
Municipality ^a	Confirmed				Suspected			
	Cases	%	Deaths ^b	%	Cases	%	Deaths ^b	%
Avaré	4	14.3	1	9.1	11	8.0	2	13.3
Buri	5	17.8	3	27.3	8	5.8	3	20.0
Piraju	11	39.3	5	45.4	64	46.4	7	46.7
Sarutaiá	7	25.0	2	18.2	53	38.4	3	20.0
Tejupá	1	3.6	–	–	2	1.4	–	–
Total	28	100.0	11	100.0	138	100.0	15	100.0

Zika & Microcephaly

Increase over baseline incidence
 > 3 SD > 20 SD



Cases in States with increases over 20 SD



Guillain-Barré Syndrome...

BAHIA STATE, BRAZIL



Incidence (preliminary):
1 case per 1,000 infections (?)

Paixão ES et al. Am J Public Health 2016; 106: 606-12



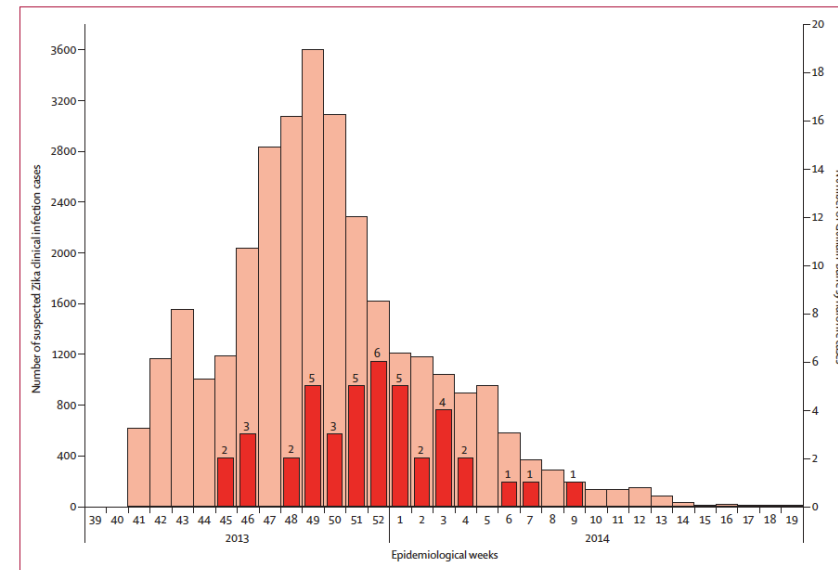
FRENCH POLYNESIA



Incidence:
0.24 case per 1,000 infections

Case-control ($P < 0.001$):
GBS – 100% ZIKV (+)
Controls – 56% ZIKV (+)

Cao-Lormeau et al. Lancet 2016 (online)





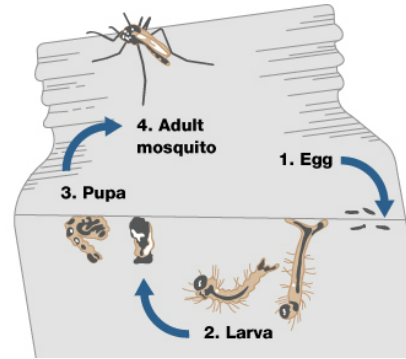
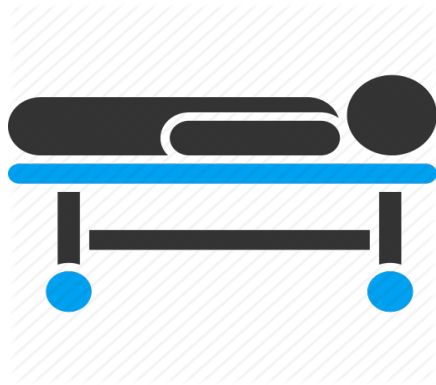
CHIKUNGUNYA



Hospitals as places of acquisition



Hospital-Acquired Vector-Transmitted Dengue Fever: An Overlooked Problem?



Juliana Almeida-Nunes, RN;¹
 Izabel Marcilio, MD;¹
 Maura S. Oliveira, MD;²
 Elenice M.N. Gonçalves, PhD;³
 Marjorie V. Batista, MD;²
 Alfredo Mendrone Jr, MD;⁴
 José E. Levi, PhD;⁴
 Silvia F. Costa, MD;^{5,6}
 Anna S. Levin, MD, PhD^{2,5,6}

TABLE 1. Characteristics of 4 Patients with Hospital-Acquired Vector-Transmitted Dengue Fever (Hospital das Clínicas, University of São Paulo, Brazil, 2015)

Patient	Date of Symptom Onset	Age, y	Sex	Days of Hospitalization Until First Symptom	Underlying Diseases	Positive Diagnostic Test	Days from Symptoms Onset to Positive Test	Outcome (days from symptom onset)	Comments
1	March 23	32	M	22	Decompensated alcoholic cirrhosis (edema, ascites, and cutaneous bleeding)	NSI	4	Cure (12)	...
2	April 6	33	F	37	Surgical site infection after spinal arthrodesis	IgM	8	Cure (5)	...
3	April 24	24	M	46	Schizophrenia + auto aggression + electroconvulsive therapy	IgM	6	Cure (4)	...
4	May 31	17	M	10	Acute recurrent myeloid leukemia + conditioning for hematopoietic stem cell transplant	RT-PCR and IgM	13	Death (14)	Comorbid bloodstream infection by <i>Pseudomonas aeruginosa</i> and influenza A infection

NOTE. M, male; F, female; RT-PCR, real-time reverse-transcriptase polymerase chain reaction; ..., not tested; NSI, non-structural protein 1 antigen capture test; IgM, IgM capture enzyme-linked immunosorbent assay.

Nosocomial Transmission of Dengue

Zsuzsanna Nemes,*
Gabriella Kiss,* Edit P. Madarassi,*
Zoltán Peterfi,* Eموke Ferenczi,†
Tamas Bakonyi,‡§
and Gabor Ternak*

*County Hospital, Pécs, Hungary; †Johan
Bela National Center for Epidemiology,
Budapest, Hungary; ‡University of
Veterinary Medicine, Vienna, Austria; and
§Szent Istvan University, Budapest,
Hungary

Emerging Infectious Diseases

Vol. 10, No. 10, October 2004

Nosocomial transmission of dengue fever via needlestick. An occupational risk

Caitlin Morgan*, Stavroula-Maria Paraskevopoulou,
Elizabeth A. Ashley, Fey Probst, David Muir

Imperial College NHS Trust, Charing Cross Hospital, Fulham Palace Road, London W6 8RF, UK

[Travel Medicine and Infectious Disease \(2015\) 13, 271–273](#)

Needle-stick dengue virus infection in a health-care worker at a Japanese hospital

Kenji OHNISHI

Department of Infectious Diseases, Tokyo Metropolitan Bokutoh General Hospital, Japan

J Occup Health 2015; 57: 482–483



Evidence for Transmission of Zika Virus by Platelet Transfusion

Table 1. Results of Molecular and Serologic Testing of Samples Obtained from the Platelet Donor and the Two Recipients.*

Donor or Patient†	Molecular Testing				Serologic Testing						
	ZIKV (Ct)‡		CHIKV	DENV	PRNT§	IFA IgG¶		ZIKV POC		DENV-Capture ELISA**	
	Plasma	Urine	Plasma	Plasma	ZIKV	ZIKV	DENV	IgM	IgG	IgM	IgG
Donor											
Day -3	Pos (23)		Neg	Neg							
Day 11	Neg	Pos (33)	Neg	Neg	1:1280	++	+/-	Pos (143)	Pos (239)	Pos (1.4)	Neg (0.5)
Patient 1											
Day -4	Neg		Neg	Neg		-	+++	Neg (7)	Pos (57)	Neg (0.6)	Pos (5.0)
Day 6	Pos (33)		Neg	Neg		+	++++	Neg (9)	Sus (32)	Neg (0.7)	Pos (4.9)
Day 31	Neg				1:2560	++++	++++	Sus (33)	Pos (335)	Pos (2.3)	Pos (5.4)
Patient 2											
Day -1	Neg		Neg	Neg							
Day 1	Neg		Neg	Neg							
Day 23	Pos (36)	Neg	Neg	Neg	1:40	-	-	Neg (7)	Sus (20)	Neg (0.1)	Neg (0.3)
Day 51	Neg/Pos††				1:20	++	+/-	Neg (4)	Neg (17)	Neg (0.2)	Neg (0.3)
Day 71	Neg							Neg (12)	Neg (5)		

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Jane A. Dobbin, M.D.

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Ingrid P. Arcuri, M.D.

Rita C.B.S. Tavares, M.D.

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Rio de Janeiro, Brazil

Staff

Workload

Places

Resources

RISKS



Rearrange health care

Lessons learned from epidemics



Secretaria da Saúde



Fluxo de Assistência ao paciente com suspeita de Dengue na Rede de Saúde de Joinville

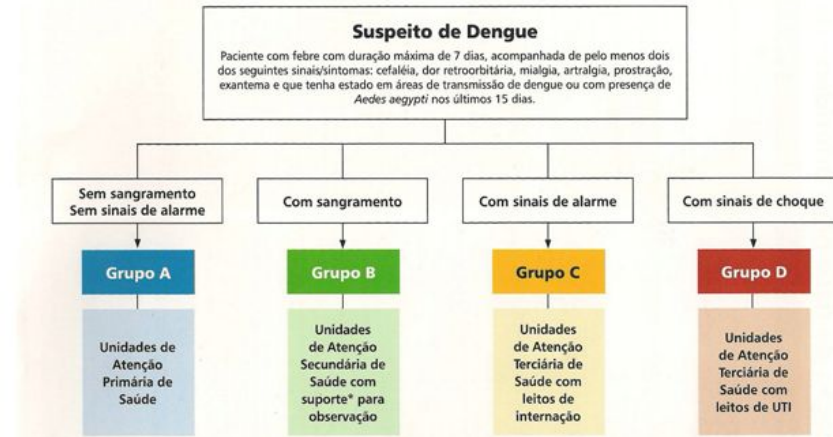
Caso Suspeito de Dengue

Paciente com doença febril aguda, com duração máxima de sete dias, acompanhada de pelo menos DOIS dos seguintes sinais/sintomas: cefaléia, dor retro-orbitária, mialgia, artralgia, prostração, exantema, associados ou não a presença de sangramentos ou hemorragias.



ORGANIZAÇÃO DE ATENDIMENTO DO PACIENTE COM DENGUE

Classificação de Risco de Dengue

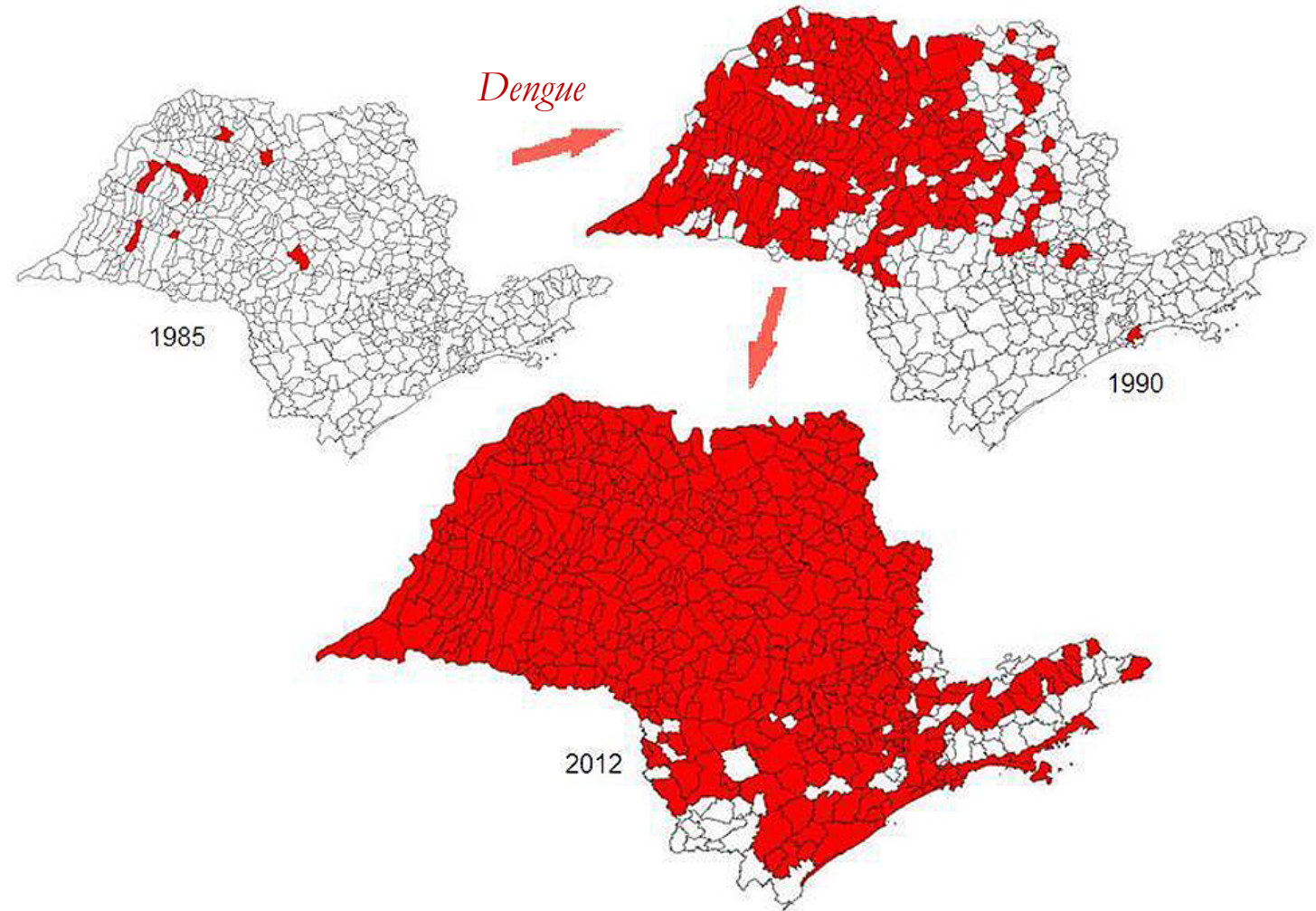


Classificação de risco de acordo com os sinais e sintomas

- Azul: Grupo A – atendimento de acordo com o horário de chegada
- Verde: Grupo B – prioridade não urgente
- Amarelo: Grupo C – urgência, atendimento o mais rápido possível
- Vermelho: Grupo D – emergência, paciente com necessidade de atendimento imediato

Risk stratification and timely approach

Lessons learned from epidemics



Information and surveillance

Lessons learned from epidemics



Hospitals must comply with vector control recommendations

Lessons learned from epidemics

Thank you



cmfortaleza@uol.com.br